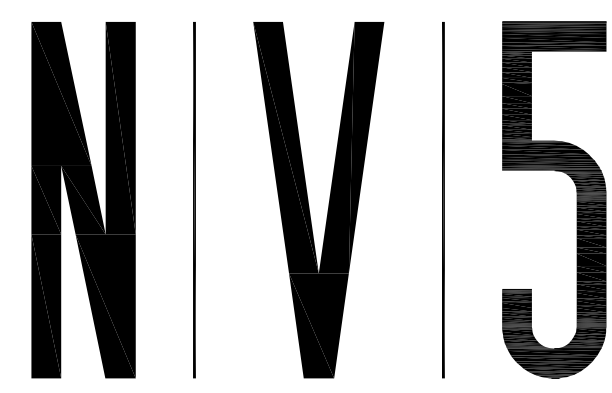
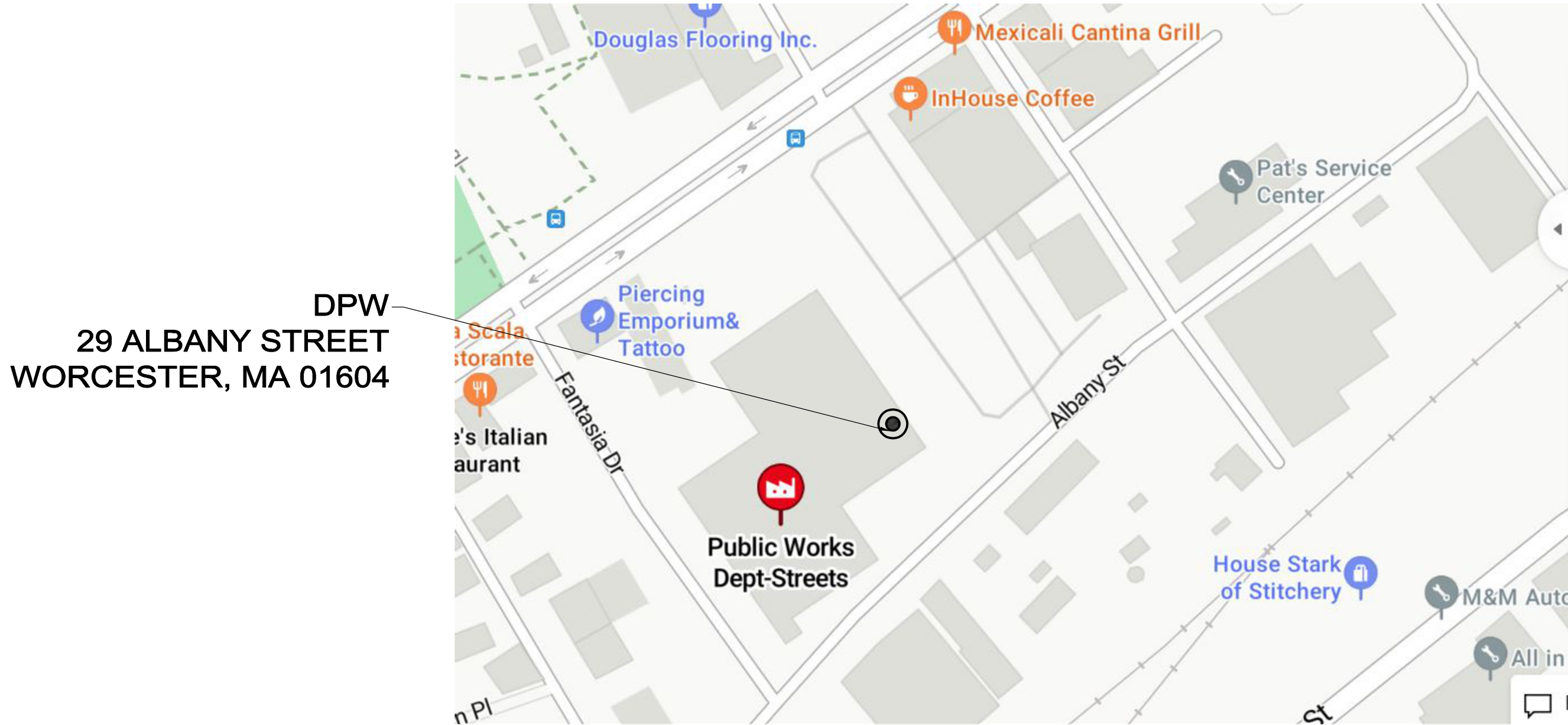


CITY OF WORCESTER DPW  
HEATING SYSTEM UPGRADE  
29 ALBANY STREET  
OCTOBER 15, 2025



200 Brickstone Square,  
Andover, MA 01810-1488  
T. 978-296-6200  
F. 978-296-6201  
W. www.nv5.com

LOCALITY MAP



INDEX OF DRAWINGS

T100	COVER SHEET
M001	MECHANICAL LEGEND, NOTE, SYMBOLS AND ABBREVIATIONS
MD201	MECHANICAL PIPING DEMO PLAN
M201	MECHANICAL PIPING PLAN
E001	ELECTRICAL LEGEND, ABBREVIATIONS AND GENERAL NOTES
ED101	ELECTRICAL POWER DEMO PLAN
E101	ELECTRICAL POWER PLAN



200 Brickstone Square,  
Andover, MA 01810-1488  
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CLIENT

CONSULTANT

PROJECT NAME

CITY OF WORCESTER  
HEATING  
SYSTEM  
UPGRADE  
29 ALBANY ST.

Worcester, MA

KEY PLAN

REVISION/ISSUANCE

#	DESCRIPTION	DATE

PROJECT NO.: 25-000984

DESIGNED BY: DCS

CHECKED BY: CH

DATE: 10.15.2025

SCALE: NTS

SHEET NAME

COVER SHEET

SHEET NUMBER

T001

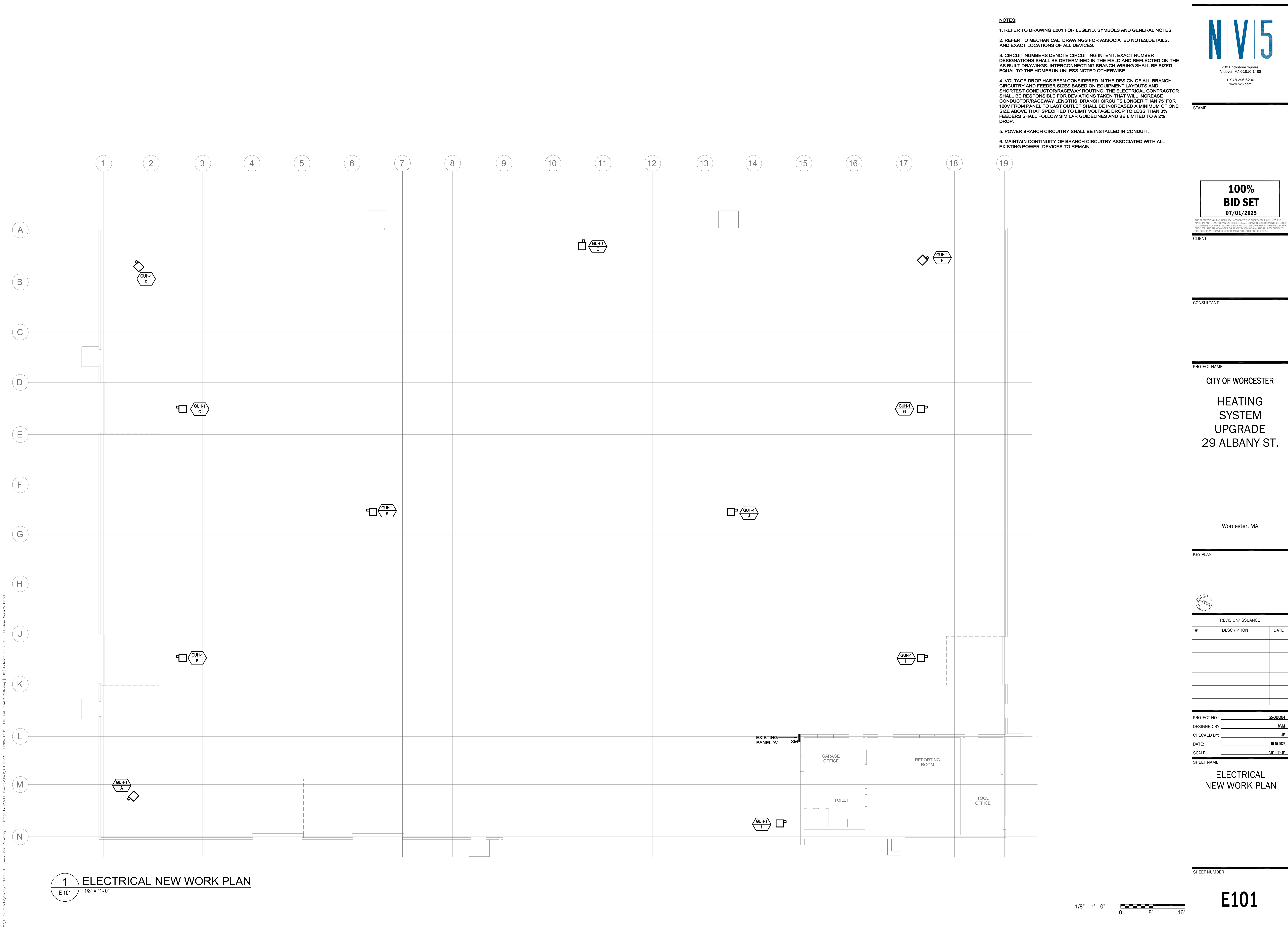


W:\B\EST\proj\2025\25-1005894 - Worcester 29 Albany St. Garage Heat\200 Drawings\CD\CD\_25-1005894\_0001 ELECTRICAL LEGEND, NOTES AND ABBREVIATIONS.dwg [2001] October 06, 2025 - 11:25am MarkMcDonnell

MECHANICAL EQUIPMENT SCHEDULE																														
LOAD TAG	STARTER LOCATION	LOAD						STARTER										POWER SOURCE		CONNECTION						BRANCH CIRCUIT	REMARKS			
		HP	FLA	KVA	VOLT	PH	NEMA SIZE	TYPE	OVERCURRENT			PB	HOA	INDICATING LIGHTS			AUXILIARY		PANEL	C/B	FLEX	JB	REC	DISC						
									CB	RK1 FUSE	MCP			R	G	A	CPT	CONTACTS						AS	AF			NEMA		
																		NO											NC	
GUH-1A	NOTE 8		3.8	0.4	120	1														A-29	20A/1P					30	5	1	2#10*#10G-3/4"C	
GUH-1B	NOTE 8		3.8	0.4	120	1																				30	5	1	2#10*#10G-3/4"C	
GUH-1C	NOTE 8		3.8	0.4	120	1																				30	5	1	2#10*#10G-3/4"C	
GUH-1D	NOTE 8		3.8	0.4	120	1																				30	5	1	2#10*#10G-3/4"C	
GUH-1E	NOTE 8		3.8	0.4	120	1																				30	5	1	2#10*#10G-3/4"C	
GUH-1F	NOTE 8		3.8	0.4	120	1																				30	5	1	2#10*#10G-3/4"C	
GUH-1G	NOTE 8		3.8	0.4	120	1																				30	5	1	2#10*#10G-3/4"C	
GIUH-1H	NOTE 8		3.8	0.4	120	1																				30	5	1	2#10*#10G-3/4"C	
GUH-1I	NOTE 8		3.8	0.4	120	1																				30	5	1	2#10*#10G-3/4"C	
GUH-1J	NOTE 8		3.8	0.4	120	1																				30	5	1	2#10*#10G-3/4"C	
GUH-1K	NOTE 8		3.8	0.4	120	1																				30	5	1	2#10*#10G-3/4"C	
NOTES:																														
1. NOTES 2-6 APPLY TO ALL APPLICABLE LOADS. 2. PROVIDE THERMAL OVERLOAD UNITS FOR ALL STARTERS SIZED TO MATCH LOAD NAMEPLATE AND NEC REQUIREMENTS. 3. BRANCH CIRCUIT WIRING METHODS SHALL BE AS NOTED ON THE DRAWINGS AND/OR SPECIFICATIONS FOR THE APPLICABLE LOCATION. THE FINAL THREE FEET (MAXIMUM) SHALL BE FLEXIBLE METAL OR LIQUIDTIGHT FLEXIBLE METAL CONDUIT. 4. COPPER BRANCH CIRCUIT CONDUCTOR SIZING BASED UPON NEC TABLE 310.15(B)(16). MAKE ADJUSTMENTS TO CONDUCTORS FOR TEMPERATURE OR VOLTAGE DROP THAT EXCEED NEC AND SPECIFICATION CRITERIA. 5. RACEWAY SIZES ARE BASED UPON GRSC AND LFMC WITH THWN CONDUCTORS. 6. VFD SHALL BE CONTROLLED VIA REMOTE 4-200mA OR 0-5V SIGNAL PROVIDED BY THE HVAC ATC CONTRACTOR. 7. REQUIRED DISCONNECT IS PROVIDED INTEGRAL/PREWIRED TO MECHANICAL EQUIPMENT. 8. REQUIRED STARTER IS PROVIDED INTEGRAL/PREWIRED TO MECHANICAL EQUIPMENT. 9. DISCONNECT FOR 281W AND 282W MOTORS SHALL BE SIX POLE. 10. PROVIDE NEUTRAL FROM SOURCE TO STARTER ONLY FOR 120V CONTROL POWER OF 208V 3PH UNITS. 11. FUSES FOR DISCONNECT SWITCHES SHALL BE CLASS RK5.																	KEY FVNR FULL VOLTAGE NON-REVERSING FVR FULL VOLTAGE REVERSING 2S1W TWO SPEED SINGLE WINDING 2S2W TWO SPEED TWO WINDING RVAT REDUCED VOLTAGE AUTOTRANSFORMER RVVPV REDUCED VOLTAGE PART WINDING RVYDOT REDUCED VOLTAGE WYE DELTA OPEN TRANSITION RVYDCT REDUCED VOLTAGE WYE DELTA CLOSED TRANSITION MMS MANUAL MOTOR STARTER CB CIRCUIT BREAKER MCP MOTOR CIRCUIT PROTECTOR PB START AND STOP PUSH BUTTON HOA HAND-OFF-AUTOMATIC SELECTOR SWITCH OPT CONTROL POWER TRANSFORMER VFD VARIABLE FREQUENCY DRIVE W/O BYPASS VFDB VARIABLE FREQUENCY DRIVE W/ BYPASS CNTCR CONTRACTOR - NO THERMAL OVERLOAD													



W:\B\25\proj\A\2025\25-005894 - Worcester 29 Albany St Garage Heat\25-005894-101 ELECTRICAL NEW WORK PLAN.dwg [101] October 06, 2025 - 11:24am MarcMcDonnell



- NOTES:**
1. REFER TO DRAWING E001 FOR LEGEND, SYMBOLS AND GENERAL NOTES.
  2. REFER TO MECHANICAL DRAWINGS FOR ASSOCIATED NOTES, DETAILS, AND EXACT LOCATIONS OF ALL DEVICES.
  3. CIRCUIT NUMBERS DENOTE CIRCUITING INTENT. EXACT NUMBER DESIGNATIONS SHALL BE DETERMINED IN THE FIELD AND REFLECTED ON THE AS BUILT DRAWINGS. INTERCONNECTING BRANCH WIRING SHALL BE SIZED EQUAL TO THE HOMERUN UNLESS NOTED OTHERWISE.
  4. VOLTAGE DROP HAS BEEN CONSIDERED IN THE DESIGN OF ALL BRANCH CIRCUITRY AND FEEDER SIZES BASED ON EQUIPMENT LAYOUTS AND SHORTEST CONDUCTOR/RACEWAY ROUTING. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR DEVIATIONS TAKEN THAT WILL INCREASE CONDUCTOR/RACEWAY LENGTHS. BRANCH CIRCUITS LONGER THAN 75' FOR 120V FROM PANEL TO LAST OUTLET SHALL BE INCREASED A MINIMUM OF ONE SIZE ABOVE THAT SPECIFIED TO LIMIT VOLTAGE DROP TO LESS THAN 3%. FEEDERS SHALL FOLLOW SIMILAR GUIDELINES AND BE LIMITED TO A 2% DROP.
  5. POWER BRANCH CIRCUITRY SHALL BE INSTALLED IN CONDUIT.
  6. MAINTAIN CONTINUITY OF BRANCH CIRCUITRY ASSOCIATED WITH ALL EXISTING POWER DEVICES TO REMAIN.



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CLIENT

CONSULTANT

PROJECT NAME

CITY OF WORCESTER  
HEATING  
SYSTEM  
UPGRADE  
29 ALBANY ST.

Worcester, MA

KEY PLAN



REVISION/ISSUANCE		
#	DESCRIPTION	DATE

PROJECT NO.: 25-005894  
DESIGNED BY: MM  
CHECKED BY: JF  
DATE: 10.15.2025  
SCALE: 1/8" = 1' - 0"

SHEET NAME

ELECTRICAL  
NEW WORK PLAN

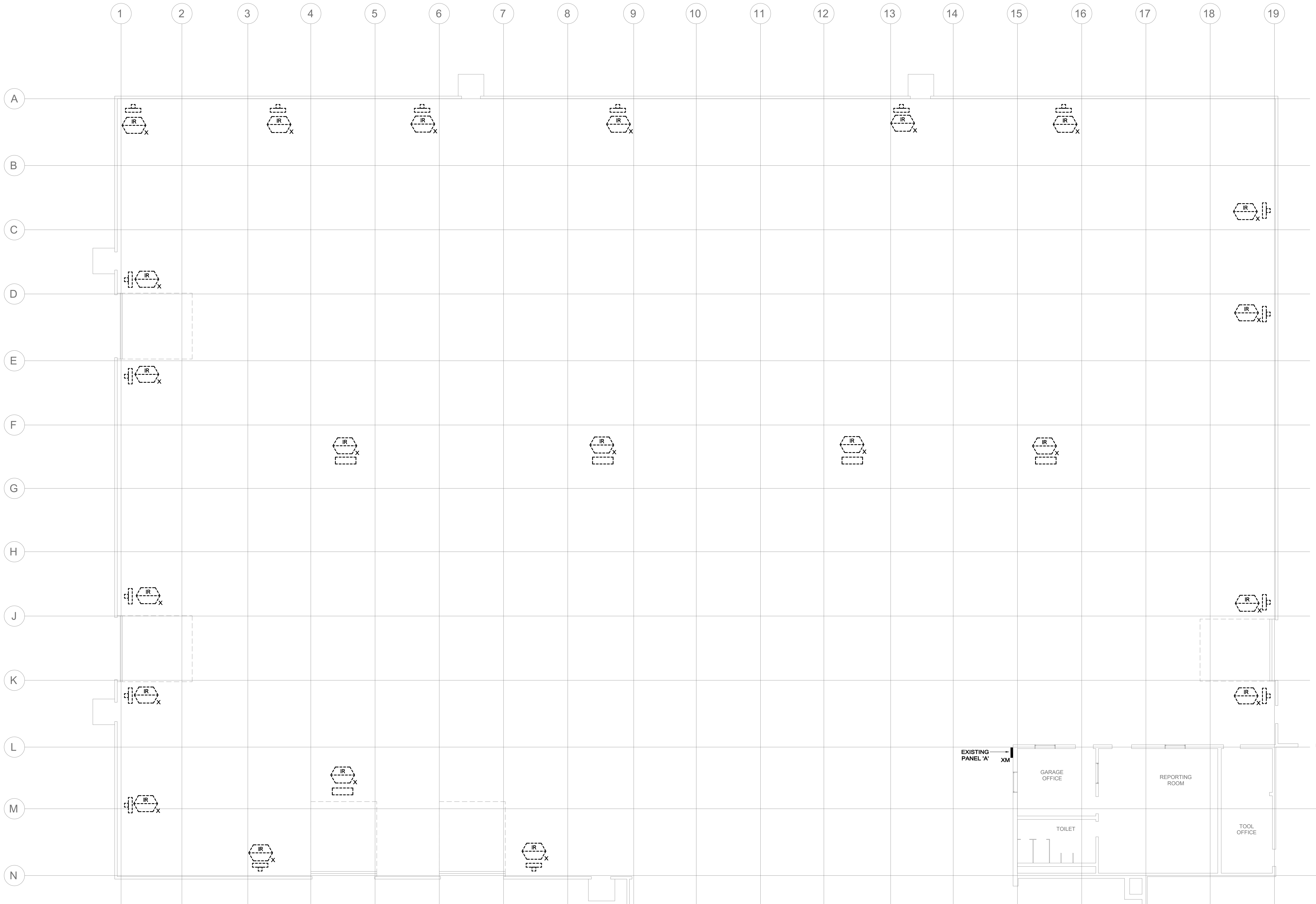
SHEET NUMBER

**E101**

**1**  
E 101  
ELECTRICAL NEW WORK PLAN  
1/8" = 1' - 0"

1/8" = 1' - 0"  
0 8' 16'

W:\BIDS\Projects\2025\25-000284 - Worcester 29 Albany St - Warehouse - Electrical - Power - DWG - 10/01/2025 - 11:25am - Marc McDonald



**1** ELECTRICAL DEMOLITION PLAN  
ED 101 1/8" = 1' - 0"

- NOTES:**
1. REFER TO DRAWING E001 FOR LEGEND, SYMBOLS AND DEMOLITION NOTES.
  2. REFER TO MECHANICAL DRAWINGS FOR ASSOCIATED NOTES, DETAILS AND EXACT LOCATIONS OF ALL EQUIPMENT.
  3. MAINTAIN CONTINUITY OF BRANCH CIRCUITRY ASSOCIATED WITH ALL EXISTING POWER DEVICES TO REMAIN.

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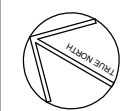
CONSULTANT

PROJECT NAME

CITY OF WORCESTER  
HEATING  
SYSTEM  
UPGRADE  
29 ALBANY ST.

Worcester, MA

KEY PLAN



REVISION/ISSUANCE		
#	DESCRIPTION	DATE

PROJECT NO.: 25-000284  
DESIGNED BY: MM  
CHECKED BY: JF  
DATE: 10.15.2025  
SCALE: 1/8" = 1' - 0"

SHEET NAME

ELECTRICAL  
DEMOLITION PLAN

SHEET NUMBER

**ED101**

1/8" = 1' - 0"





ABBREVIATIONS			
GENERAL		N/A	NOT APPLICABLE
A	COMPRESSED AIR	NIC	NORMALLY CLOSED OR NOISE CRITERIA
AD	ACCESS DOOR	NC	NOT IN CONTRACT
ADDL	ADDITIONAL	NO	NORMALLY OPEN
AF	AIR FOIL	NTS	NUMBER
AFR	ABOVE FINISHED FLOOR	NO	NOMINAL
ALT	ABOVE FINISHED ROOF	NTS	NOT TO SCALE
AMP	AMPERE	OA	OUTSIDE AIR
AP	ACCESS PANEL	OS	OUTSIDE AIR INTAKE
APD	AIR PRESSURE DROP	OC	ON CENTER
ARCH	ARCHITECT	OD	OUTSIDE DIAMETER
AS	AIR STREAM	OD	OPEN DRIP PROOF
ATC	AUTOMATIC TEMPERATURE CONTROL	OV	OUTLET VELOCITY
ATM	ATMOSPHERE	PCF	POUNDS PER CUBIC FOOT
AVE	AVERAGE	PD	PRESSURE DROP
BHP	BRAKE HORSEPOWER	PH	PHASE
BI	BACKWARDS INCLINED	PI	PISTON
BLDG	BUILDING	POS	PROVIDED BY OTHER SECTION
BOB	BOTTOM OF DUCT	PSI	POUNDS PER SQUARE INCH
BSMT	BASEMENT	PSIA	POUNDS PER SQUARE INCH ABSOLUTE
BTU	BRITISH THERMAL UNIT	PSID	POUNDS PER SQUARE INCH DIFFERENTIAL
BTUH	BTU PER HOUR	PSIG	POUNDS PER SQUARE INCH GAUGE
		PVC	POLYVINYL CHLORIDE
C TO C	CENTER TO CENTER	QTY	QUANTITY
CENT	CENTRIFUGAL	R	RADIUS
CF	CUBIC FEET	RA	RETURN AIR
CFM	CUBIC FEET PER MINUTE	RET	RETURN
CL	CENTERLINE	REQD	REQUIRED
CLG	CEILING OR COILING	RH	RELATIVE HUMIDITY
CO	CARBON MONOXIDE	RLA	RUNNING LOAD AMPS
COL	COLUMN	REL	RELIEF
CONC	CONCRETE	RM	ROOM
CONN	CONNECTION	RFL	RELOCATED FAN
CONTR	CONTRACTOR	RM	ROOM
D	DRAIN OR DEPTH	RPM	REVOLUTIONS PER MINUTE
DB	DRY BULB TEMPERATURE	SCH	SCHEDULE
DEG	DEGREE	SCR	SCREEN
DDC	DIRECT DIGITAL CONTROL	SCT	SATURATED CONDENSING TEMPERATURE
DIA	DIAMETER	SDET	SMOKE DETECTOR
DIM	DIMENSION	SEN	SENSIBLE
DN	DOWN	SHC	SENSIBLE HEAT CAPACITY
DP	DIFFERENTIAL PRESSURE	SP	STATIC PRESSURE
EA	EACH OR EXHAUST AIR	SPECS	SPECIFICATIONS
EAT	ENTERING AIR TEMPERATURE	SQ	SQUARE
EFF	EFFICIENCY	SF	SQUARE FEET
ELEC	ELECTRICAL	SS	STAINLESS STEEL
ELEV	ELEVATION	ST	STEEL
EMER	EMERGENCY	SUP	SUPPLY
EMS	ENERGY MANAGEMENT SYSTEM	T	TEMPERATURE
ENTER	ENTER	TA	THROWAWAY
ESP	EXTERNAL STATIC PRESSURE	TEL	TELEPHONE
EWI	ENTERING WATER TEMPERATURE	TEFC	TOTALLY ENCLOSED FAN COOLED
EXH	EXHAUST	TEMP	TEMPERATURE
EXIST	EXISTING	TSTAT	THERMOSTAT
EXT	EXTERNAL	TON	12,000 BTUH COOLING CAPACITY
EXP	EXPANSION	TOT	TOTAL
		TYP	TYPICAL
F	FAHRENHEIT	UC	UNDERCUT DOOR
FA	FREE AREA	V	VOLTS (ELECTRICAL)
FC	FLEXIBLE CONNECTION	VEL	VELOCITY
FLA	FULL LOAD AMPS		
FLEX	FLEXIBLE	W	WIDTH OR WATT
FLDR	FLOOR DRAIN	W/	WITH
FM	FEET PER MINUTE	WB	WET BULB TEMPERATURE
FPS	FEET PER SECOND	WC	WATER COLUMN
FRP	FIBERGLASS REINFORCED PLASTIC	WG	WATER GAUGE
FS	FLOW SWITCH	WIO	WITHOUT
FT	FEET	WPD	WATER PRESSURE DROP
		WTD	WATER TEMPERATURE DIFFERENCE
G	GAS		
GA	GAUGE	X	EXISTING EQUIPMENT TO BE REMOVED
GAL	GALLONS	XM	EXISTING EQUIPMENT TO REMAIN
GALV	GALVANIZED	XN	NEW LOCATION OF RELOCATED EQUIPMENT
GC	GENERAL CONTRACTOR	XR	EXISTING EQUIPMENT TO BE RELOCATED
GFU	GLYCOL FEED UNIT		
GPH	GALLONS PER HOUR	DUCT	DUCT
GPM	GALLONS PER MINUTE	ACD	AUTOMATIC CONTROL DAMPER
GRD	GRADE	BDD	BACKDRAFT DAMPER
GWB	GYPSUM WALL BOARD	BOD	BOTTOM OF DUCT
		CD	CEILING DIFFUSER
HB	HOSE BIBB CONN.	CV	CONSTANT VOLUME SUPPLY AIR TERMINAL
HD	HEAD	DIF	DIFFUSER
HGT	HEIGHT	EA	EXHAUST AIR
HP	HORSEPOWER OR HIGH POINT	RA	RETURN AIR
HR	HOUR	RG	RETURN GRILLE
HTG	HEATING	SA	SUPPLY AIR
HZ	HERTZ (FREQUENCY, CYCLES PER SECOND)	SG	SUPPLY GRILLE
ID	INSIDE DIAMETER	TOD	TOP OF DUCT
IN	INCHES	TSP	TOTAL STATIC PRESSURE (IN. WG)
KW	KILOWATT	VD	VOLUME DAMPER
		WMS	WIRE MESH SCREEN
L	LENGTH		
LAT	LEAVING AIR TEMPERATURE	EQUIPMENT	EQUIPMENT
LB	POUND	DDC	DIRECT DIGITAL CONTROL
LF	LINEAR FEET	DX	DIRECT EXPANSION
LP	LOW POINT	EBB	ELECTRIC BASEBOARD HEATER
LRA	LOCKED ROTOR AMPS	ECH	ELECTRIC CABINET HEATER
LUVR	LOUVER	EF	EXHAUST FAN
LVD	LOUVERED DOOR	EUH	ELECTRIC UNIT HEATER
LVS	LEAVING WATER TEMPERATURE	F	FAN
LWT	LEAVING WATER TEMPERATURE	F	FAN
		UH	UNIT HEATER
MAX	MAXIMUM	VFD	VARIABLE FREQUENCY DRIVE
MBH	THOUSAND BTUH	WAC	WINDOW AIR CONDITIONER
MCA	MINIMUM CIRCUIT AMPS		
MECH	MECHANICAL		
MEZZ	MEZZANINE		
MFR	MANUFACTURER		
MIN	MINIMUM		
MU	MAKE-UP WATER		

HVAC DEMOLITION NOTES	
1.	THE LOCATIONS OF EXISTING EQUIPMENT INCLUDING PIPING, DUCTWORK, EQUIPMENT, CONDUITS, ETC ARE SHOWN IN AN APPROXIMATE WAY ONLY. VISIT THE SITE PRIOR TO SUBMISSION OF THE BIDS AND COMMENCEMENT OF WORK TO BECOME FAMILIAR WITH THE ACTUAL CONDITIONS AND EXTENT OF THE WORK.
2.	TRACE AND LABEL ALL EXISTING SYSTEMS WITHIN THE DEMOLITION AREA AND BEYOND PRIOR TO DISCONNECTION AND REMOVAL. TO ENSURE THAT NO AREA OUTSIDE THE DEMOLITION AREA IS AFFECTED. REVIEW IN DETAIL WITH THE GENERAL CONTRACTOR AND OWNER WHAT IS TO BE REMOVED AND REMAIN PRIOR TO WORK COMMENCING THE DEMOLITION. THERE SHALL BE NO INTERRUPTION OF SERVICES OUTSIDE THE DEMOLITION AREA WITHOUT APPROVAL FROM THE OWNER'S REPRESENTATIVE.
3.	COORDINATE EQUIPMENT REMOVAL WITH ALL PARTIES TO PROVIDE DISCONNECTION. REMOVE EQUIPMENT BY UNFASTENING AT THE SUPPORTS OR ATTACHMENTS. ALSO REMOVE THE ATTACHMENTS FROM THE BUILDING, LEAVING NO COMPONENT OF THE ORIGINAL INSTALLATION.
4.	EXERCISE CARE WITH EQUIPMENT THAT IS TO BE RELOCATED OR TURNED OVER TO THE OWNER. EXAMINE THE EQUIPMENT BEFORE REMOVAL IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE TO DETERMINE ITS CONDITION. DELIVER OWNERS EQUIPMENT TO AN ON-SITE LOCATION DESIGNATED BY THE OWNER AND OBTAIN ACKNOWLEDGMENT OF RECEIPT IN ORIGINAL CONDITION.
5.	INSTALL RELOCATED EQUIPMENT IN ORIGINAL CONDITION ENSURING NO DAMAGE.
6.	PROMPTLY REPAIR ANY DAMAGE CAUSED DURING/BEYOND THE EXECUTION OF WORK. DAMAGE INCLUDES BUT IS NOT LIMITED TO DESTRUCTION OF ITEMS INTENDED TO REMAIN OR TO BE SALVAGED.
7.	NOTIFY THE OWNER'S REPRESENTATIVE IMMEDIATELY OF ANY UNANTICIPATED HIDDEN CONDITIONS ENCOUNTERED DURING THE DEMOLITION.
8.	ALL ITEMS REMOVED SHALL BE OFFERED TO THE OWNER FOR SALVAGE. IF THE OWNER DOES NOT TAKE POSSESSION, DISPOSE OF THE ITEMS IN A SAFE AND LEGAL MANNER. ALL ITEMS CLASSIFIED AS HAZARDOUS SHALL BE DISPOSED AS HAZARDOUS WASTES AND A UNIFORM HAZARDOUS WASTE MANIFEST SHALL BE PROVIDED TO THE OWNER.
9.	ENSURE THE SAFE PASSAGE OF PERSONS IN AND AROUND THE BUILDING DURING DEMOLITION. PREVENT INJURY TO PERSONS AND DAMAGE TO PROPERTY. PROVIDE ADEQUATE SHORING AND BRACING TO PREVENT COLLAPSE. IMMEDIATELY REPAIR DAMAGED PROPERTY TO THE CONDITION BEFORE BEING DAMAGED. TAKE EFFECTIVE MEASURES TO PREVENT WINDBLOWN DUST.
10.	DO NOT USE CUTTING TORCHES UNTIL WORK AREA IS CLEARED OF FLAMMABLE MATERIALS. AT CONCEALED SPACES, SUCH AS PIPE INTERIORS OR SHAFTS. VERIFY CONDITION AND CONTENTS OF HIDDEN SPACE BEFORE STARTING FLAME-CUTTING OPERATIONS. MAINTAIN FIRE WATCH AND PORTABLE FIRE-SUPPRESSION DEVICES DURING FLAME-CUTTING OPERATIONS. MAINTAIN ADEQUATE VENTILATION WHEN USING CUTTING TORCHES.
11.	DRAIN, PURGE, OR OTHERWISE REMOVE, COLLECT, AND PROPERLY DISPOSE OF CHEMICALS, LIQUIDS, GASES, EXPLOSIVES, ACIDS, FLAMMABLES, OR OTHER DANGEROUS MATERIALS BEFORE PROCEEDING WITH DEMOLITION OPERATIONS.
12.	PROPERLY LABEL ALL UNLABELED PIPES THAT REMAIN WITH COLOR PIPE MARKERS AND VALVE TAGS. MOUNT A VALVE AND SERVICE CHART IN THE AREA OF DEMOLITION THAT IDENTIFIES ALL LABELED SERVICES. TURN ONE COPY OF SAME OVER TO THE OWNER.
13.	ALL DEMOLITION SCOPE ASSOCIATED WITH LOW VOLTAGE WIRING FOR CONTROLS AND ASSOCIATED INTERLOCKS SHALL BE INCLUDED IN THIS CONTRACT.

DUCTWORK	
SINGLE LINE	DOUBLE LINE
	RECTANGULAR DUCT W=WIDTH, D=DEPTH (INCHES UNLESS NOTED OTHERWISE)
	ROUND DUCT (DIA=INSIDE DIAMETER)
	ROUND SUPPLY DUCT UP
	ROUND SUPPLY DUCT DOWN
	SUPPLY DUCT UP
	SUPPLY DUCT DOWN
	ROUND RETURN DUCT UP
	ROUND RETURN DUCT DOWN
	RETURN DUCT UP
	RETURN DUCT DOWN
	ROUND EXHAUST DUCT UP
	RECTANGULAR DUCT TO ROUND DUCT
	SUPPLY/RETURN/ EXHAUST
	CEILING DUCT MOUNTED DIFFUSER/GRILLE
	TAKE-OFF TO DIFFUSER/GRILLE
	CEILING DUCT MOUNTED DIFFUSER/GRILLE
	ACOUSTICALLY LINED DUCT
	FLEXIBLE DUCT
	STANDARD RADIUS ELBOW
	SUPPLY/RETURN/EXHA UST
	FULL LENGTH SPLITTER VANES (R < W)
	WATER PRESSURE/EXHAUST
	90° TAP TAKE-OFF (45° SQUARE TO ROUND, 45° TAKE-OFF TRANSITION TO ROUND, AND BELLMOUTH, RESPECTIVELY)
	OPEN END DUCT W/ 1/2"x1/2" WMS
	MANUAL VOLUME DAMPER
	BACKDRAFT DAMPER
	STANDARD 4-WAY BLOW SUPPLY DIFFUSER
	RETURN/EXHAUST GRILLE OR REGISTER
	RETURN OR EXHAUST AIR FLOW
	SUPPLY AIR FLOW

DIAGRAM EQUIPMENT SYMBOLS	
	FILTER BANK
	UNIT HEATER
	VARIABLE FREQUENCY DRIVE
	STARTER
	CENTRIFUGAL FAN
	PROPELLER FAN

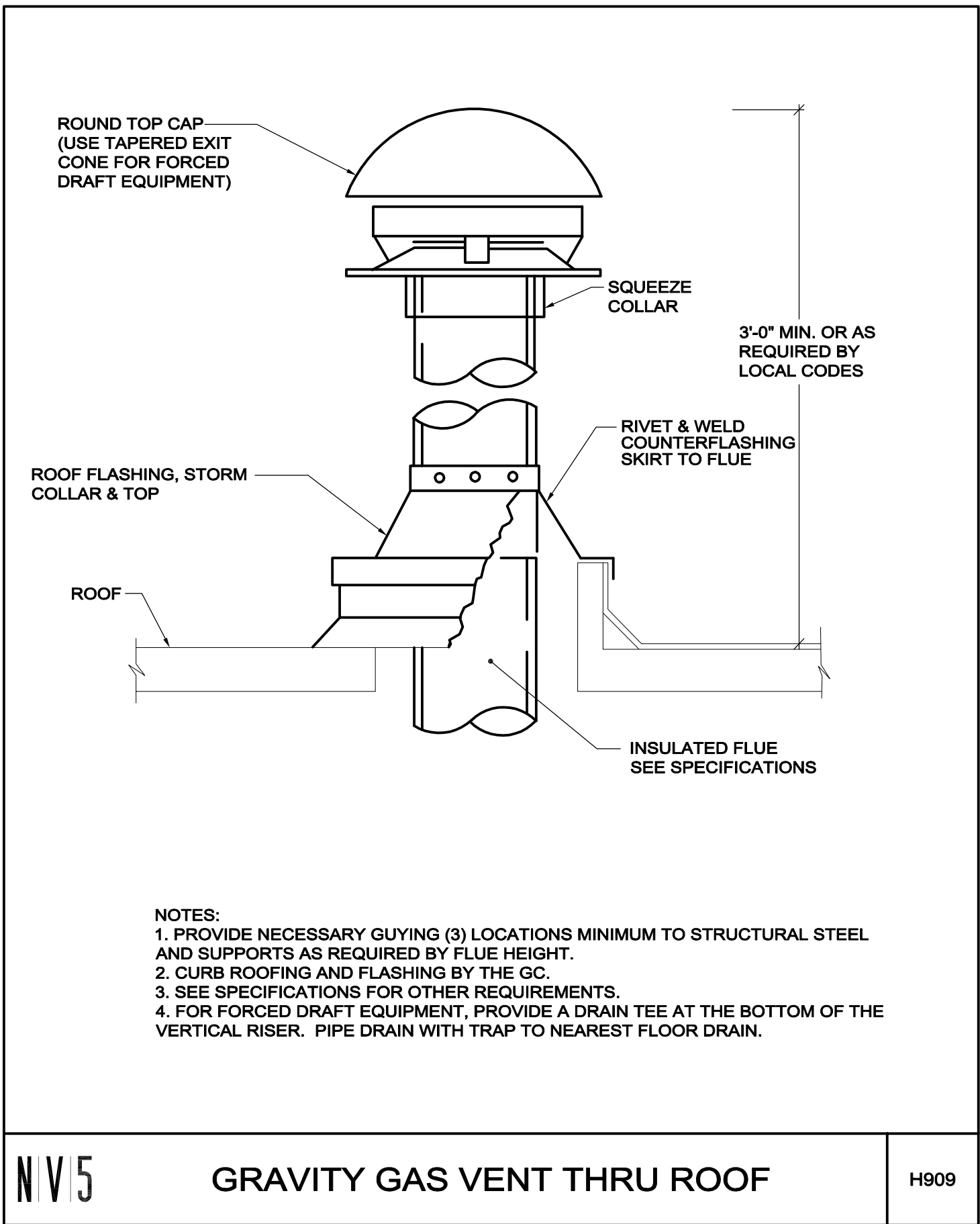
CONTROL ABBREVIATIONS	
ALM	ALARM
ATC	AUTOMATIC TEMPERATURE CONTROL
DAT	DISCHARGE AIR TEMPERATURE SENSOR
DDC	DIRECT DIGITAL CONTROL
ES	END SWITCH
FA	FAULT ALARM
HOA	HANDS-OFF AUTOMATIC SWITCH
LAT	LEAVING AIR TEMPERATURE SENSOR
S	SWITCH
SP	STATIC PRESSURE SENSOR
SPD	SPEED CONTROL
S/S	START/STOP
T	TEMPERATURE SENSOR/THERMOSTAT
TR	TEMPERATURE SENSOR/THERMOSTAT (ROOM)
VFDS	VARIABLE FREQUENCY DRIVE SPEED
WC	WATER COLUMN
X	REMOVE EXISTING ITEM

CALLOUT SYMBOLS	
	CONNECT NEW TO EXISTING
	LIMIT OF DEMOLITION
	SECTION DESIGNATION SHEET NUMBER
	REVISION NUMBER
	TEMPERATURE SENSOR OR THERMOSTAT
	REMOVE EXISTING ITEM
	S = SUPPLY A = SCHEDULED DIFFUSER (100) = CFM TO BALANCE TO
	R = RETURN A = SCHEDULED GRILLE (100) = CFM TO BALANCE TO
	EQUIPMENT REQUIRING ELECTRICAL SERVICE. SEE SCHEDULE FOR PERFORMANCE REQUIREMENTS:
	SCHEDULED EQUIPMENT UNIT NUMBER FIRST DIGIT(S) = LEVEL WHERE UNIT IS LOCATED: 1 = FIRST FLOOR R = ROOF SECOND DIGIT(S): 1 = FIRST UNIT OF THIS EQUIPMENT TYPE ON THIS LEVEL 2 = SECOND UNIT OF THIS EQUIPMENT TYPE ON THIS LEVEL 3 = THIRD UNIT OF THIS EQUIPMENT TYPE ON THIS LEVEL ETC. (DUE TO EDITING NOT ALL NUMBERS MAY BE USED)
	EQUIPMENT REUSE
	EQUIPMENT NOT REQUIRING ELECTRICAL SERVICE. SEE SCHEDULE FOR PERFORMANCE REQUIREMENTS:
	REFER TO EQUIPMENT REQUIRING ELECTRICAL SERVICE SYMBOL ABOVE FOR TAG AND DATA INFORMATION.

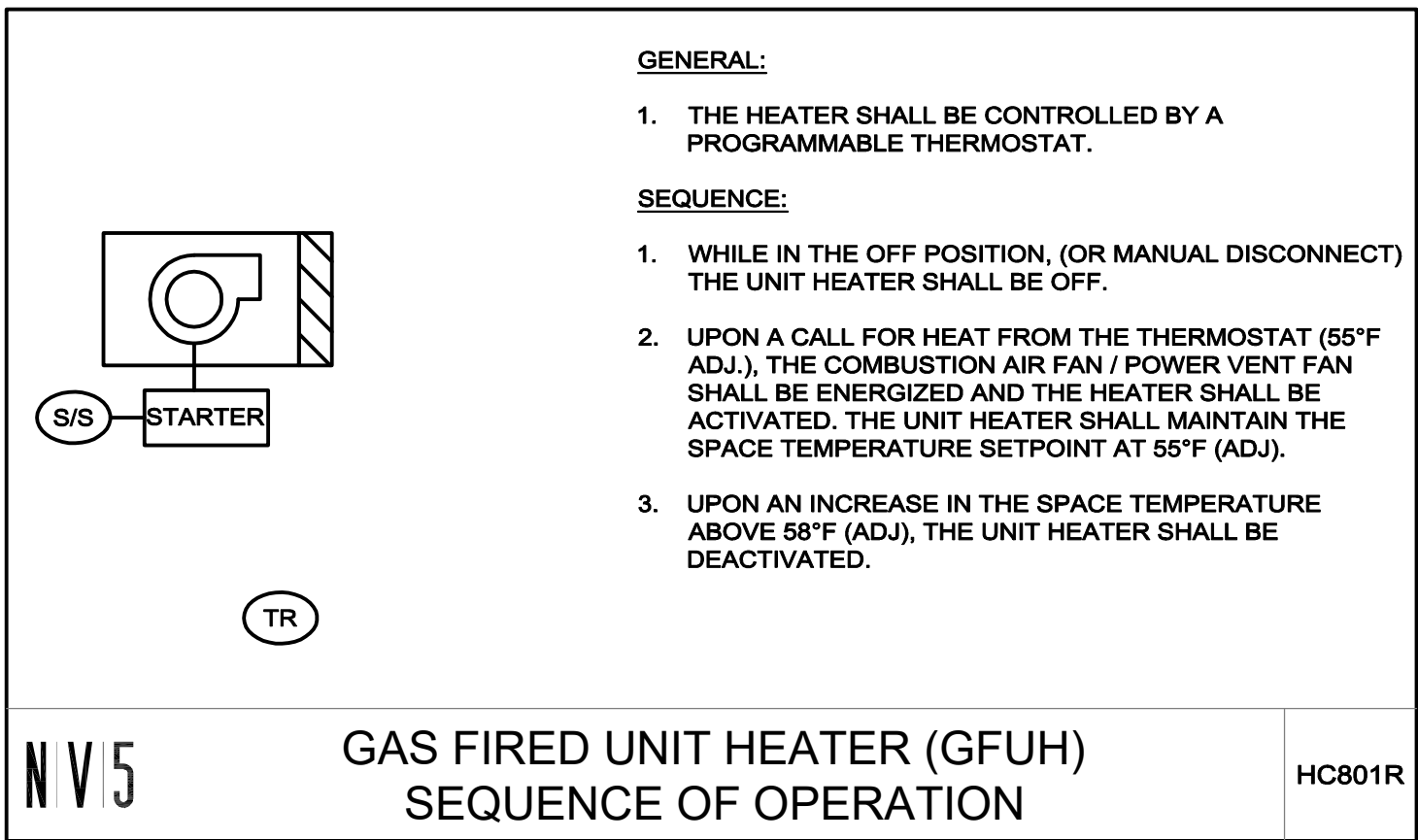
HVAC GENERAL NOTES	
1.	GENERAL NOTES APPLY TO ALL DRAWINGS.
2.	THIS PROJECT INVOLVES CONSTRUCTION INSIDE AN EXISTING STRUCTURE. CONTRACTORS, BY SUBMITTING A BID, ARE DEEMED TO BE COMPLETELY FAMILIAR WITH THE EXISTING CONDITION OF THE BUILDING AS IT INFLUENCES THE WORK DESCRIBED. ABSOLUTELY NO CLAIMS FOR EXTRA COMPENSATION WILL BE CONSIDERED FOR EXISTING CONDITIONS VISIBLE OR REASONABLY INFERRABLE FROM A CAREFUL EXAMINATION OF THE EXISTING BUILDING.
3.	THIS CONTRACTOR SHALL INSPECT THE EXISTING FIELD CONDITIONS AT THE SITE AND THE "AS-BUILT" BASE BUILDING CONTRACT DOCUMENTS PRIOR TO THE START OF ANY WORK TO DETERMINE WHAT EFFECT THE EXISTING CONDITIONS WILL HAVE ON HIS WORK. POTENTIAL PROBLEM AREAS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT AND/OR ENGINEER IMMEDIATELY.
4.	THIS CONTRACTOR SHALL CONNECT HIS WORK TO VARIOUS EXISTING PIPING, DUCTWORK, AND CONTROL SYSTEMS IN THE BASE BUILDING. THE NEW WORK SHALL BE COMPATIBLE WITH THE EXISTING SYSTEMS. LOCATION OF EQUIPMENT OR THE ROUTING OF THE VARIOUS SYSTEMS AS WELL AS OPENINGS IN FLOOR SLABS OR WALLS SHALL BE GOVERNED BY THE EXISTING CONDITIONS AS THEY APPEAR IN THE FIELD OR ON THE "AS-BUILT" DRAWINGS.
5.	CARE SHALL BE TAKEN DURING THE INSTALLATION TO NOT DAMAGE OR INTERRUPT BUILDING SYSTEMS AND SERVICES THAT ARE ALREADY INSTALLED. DAMAGE TO SUCH SYSTEMS OR EQUIPMENT CAUSED BY THIS CONTRACTOR DURING INSTALLATION SHALL BE REPAIRED AND/OR REPLACED AT THIS CONTRACTOR'S EXPENSE TO THE COMPLETE SATISFACTION OF THE BUILDING OWNER.
6.	SHUTDOWN OF EXISTING SYSTEMS FOR CONNECTION TO EXISTING SERVICES SHALL BE COORDINATED WITH THE CONSTRUCTION MANAGER OR GENERAL CONTRACTOR AND BUILDING OWNER. THIS CONTRACTOR SHALL SUBMIT REQUESTS, WHERE THEY AFFECT THE OPERATION OF THE BUILDING SYSTEMS, AT LEAST ONE WEEK IN ADVANCE OF ANY REQUIRED SHUTDOWN. THE ACTUAL SHUTDOWN PERIOD SHALL BE AS SHORT AS POSSIBLE AND AT A TIME MUTUALLY AGREEABLE TO THE BUILDING OWNER AND THE CONSTRUCTION MANAGER/GENERAL CONTRACTOR.
7.	DRAWINGS ARE DIAGRAMMATIC, THEREFORE DETERMINE EXACT LOCATIONS OF SYSTEMS AND COMPONENTS IN FIELD.
8.	ALL WORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED. OFFSETS IN PIPING AND DUCTS (INCLUDING DIVIDER DUCTS) AND TRANSITIONS AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
9.	VERIFY ALL EQUIPMENT CONNECTIONS WITH MANUFACTURER'S CERTIFIED DRAWINGS. VERIFY AND PROVIDE DUCT AND/OR PIPE TRANSITIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE ALL DIMENSIONS BEFORE FABRICATION.
10.	ALL MATERIALS AND EQUIPMENT UNLESS SPECIFICALLY INDICATED AS REUSED, SHALL BE NEW.
11.	DUCTWORK SHALL NOT RUN ALONG FULL HEIGHT PARTITIONS.
12.	EXISTING ROOM THERMOSTATS AND SENSORS SHALL BE PROTECTED DURING CONSTRUCTION AND RELOCATED AS INDICATED ON THE DRAWINGS. INSTALL NEW AND RELOCATED ROOM THERMOSTATS AND SENSORS 4 FEET AFF OR AS DIRECTED OTHERWISE BY ARCHITECT.
13.	WHEN SECTION OF DUCTWORK IS NOT LABELED FOR SIZE, THE LARGER SIZE INDICATED ON THE CONNECTED DUCT SHALL PREVAIL. SIZE OF DUCT RUN-OUTS TO DIFFUSER SHALL EQUAL DIFFUSER NECK SIZE.
14.	THE FIRE PROOFING OF THE BUILDING STRUCTURE IS NOT TO BE REMOVED FOR THE INSTALLATION OF HANGERS, SUPPORTS, DUCTWORK, ETC. IF FIRE PROOFING IS DAMAGED, IT SHALL BE REPAIRED AT THE EXPENSE OF THE TRADE.
15.	CONTRACTOR SHALL TEST AND CALIBRATE ALL CONTROLS AND VERIFY ALL ARE FULLY FUNCTIONAL AND SUBMIT DOCUMENTATION. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
16.	CONTRACTOR SHALL PROVIDE AND SUBMIT DOCUMENTATION FOR TESTING AND BALANCING OF ALL AIR AND WATER SYSTEMS, DUCT AND PIPING PRESSURE AND LEAKAGE TESTS, OPERATING AND MAINTENANCE MANUALS, AND AS BUILT DRAWINGS. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
17.	MANY EQUIPMENT SCHEDULES DO NOT LIST QUANTITIES. CONTRACTOR SHALL REFER TO ALL DRAWINGS AND PROVIDE THE REQUIRED QUANTITIES FOR ALL COMPONENTS.

GAS-FIRED UNIT HEATER SCHEDULE															(CFM, MBH)		
TAG	LOCATION	TYPE	GAS TYPE	PRESSURE (IN WC)		INPUT (MBH)	OUTPUT (MBH)	MIN. EFFICIENCY (%)	AIR		MOTOR			MANUFACTURER AND MODEL NUMBER (AS STANDARD)	REMARKS		
				MIN	MAX				CFM	DISCHARGE AIR TEMP. RISE (°F)	RPM	HP	ELECTRIC SERVICE				
												V	PH	AMPS			
GFUH-1	SEE PLANS	HANGING	NATURAL	-	14	150	124.5	83	2180	51	-	1	120	1	-	MODINE - PDP 150	SEE NOTES
NOTES:																	
1 REFER TO SPECIFICATIONS, DETAILS, AND CONTROL DRAWINGS FOR ADDITIONAL INFORMATION.																	
2 PROVIDE ALL SUPPORTS AND HANGERS NECESSARY FOR THE INSTALLATION.																	
3 PROVIDE WITH STANDARD FAN GUARD, MANUFACTURER'S DISCONNECT SWITCH.																	
4 PROVIDE WITH 2-STAGE, 100% SHUT-OFF CONTROL OPTION, NEW REMOTE PROGRAMMABLE THERMOSTAT AND CLEAR PLASTIC VENTILATED LOOKABLE COVER.																	
5 PROVIDE ALL VALVES AND UNIONS NECESSARY FOR GAS CONNECTION.																	
6 PROVIDE FLUE UP THROUGH ROOF. REFER TO MANUFACTURER RECOMMENDATION FOR SIZING AND INSTALLATION.																	

NOTES:  
1 REFER TO SPECIFICATIONS, DETAILS, AND CONTROL DRAWINGS FOR ADDITIONAL INFORMATION.  
2 PROVIDE ALL SUPPORTS AND HANGERS NECESSARY FOR THE INSTALLATION.  
3 PROVIDE WITH STANDARD FAN GUARD, MANUFACTURER'S DISCONNECT SWITCH.  
4 PROVIDE WITH 2-STAGE, 100% SHUT-OFF CONTROL OPTION, NEW REMOTE PROGRAMMABLE THERMOSTAT AND CLEAR PLASTIC VENTILATED LOCKABLE COVER.  
5 PROVIDE ALL VALVES AND UNIONS NECESSARY FOR GAS CONNECTION.  
6 PROVIDE FLUE UP THROUGH ROOF. REFER TO MANUFACTURER RECOMMENDATION FOR SIZING AND INSTALLATION.



GRAVITY GAS VENT THRU ROOF H909



GAS FIRED UNIT HEATER (GFUH) SEQUENCE OF OPERATION HC801R

100% BID SET 07/01/2025

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CLIENT

CONSULTANT

PROJECT NAME

CITY OF WORCESTER

HEATING SYSTEM UPGRADE

29 ALBANY ST.

Worcester, MA

KEY PLAN

REVISION/ISSUANCE

# DESCRIPTION DATE

PROJECT NO.: 25-000284

DESIGNED BY: DSG

CHECKED BY: CH

DATE: 10/15/2025

SCALE: NTS

SHEET NAME

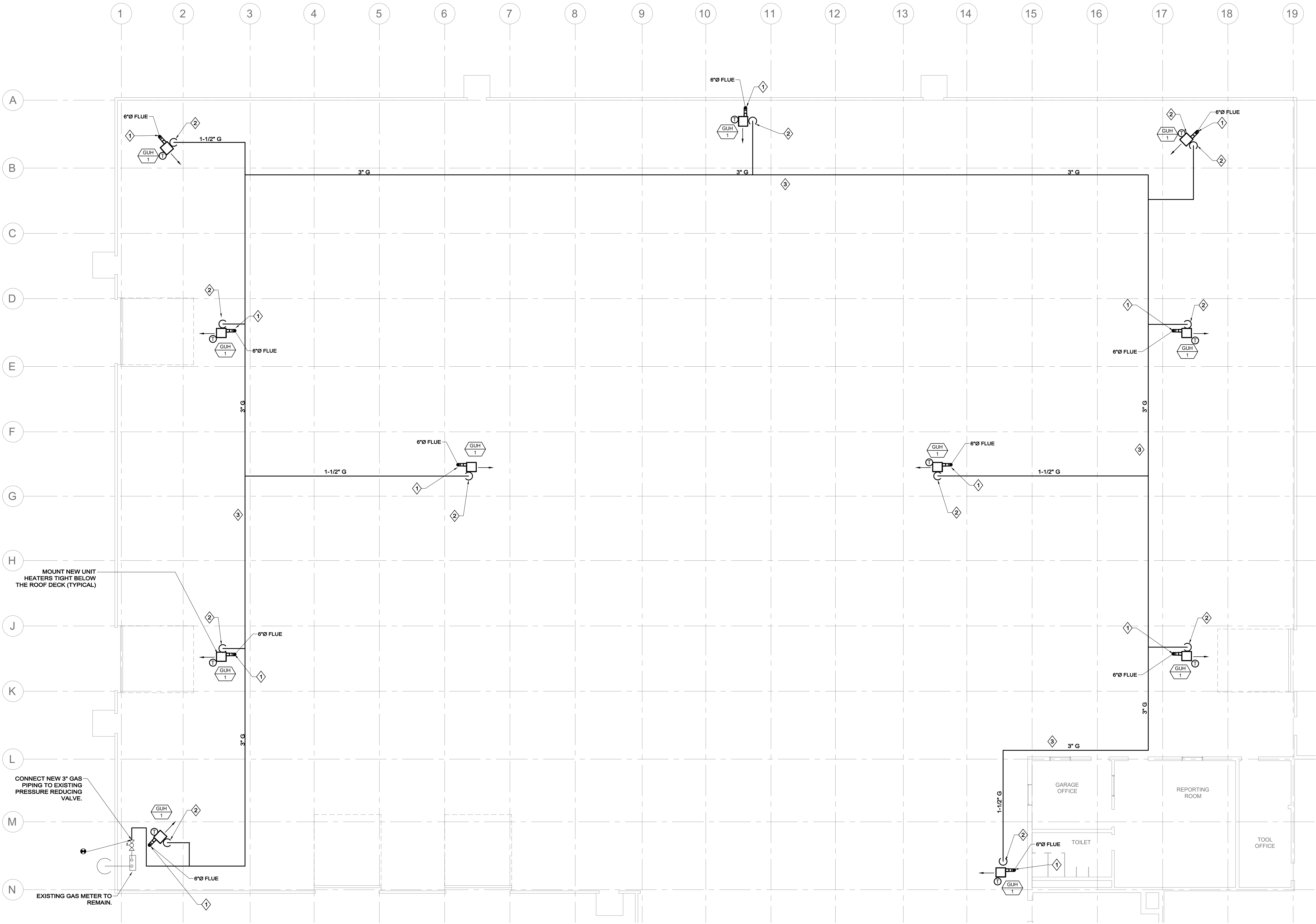
MECHANICAL LEGEND, NOTES AND ABBREVIATIONS

SHEET NUMBER

M001



W:\B\25\proj\A\2025\25-000294 - Worcester 29 Albany St. Garage Heat\100 Drawings\A\2025\25-000294-M201 Mechanical Piping PLAN.dwg [M201] Created: 06/20/2025 11:24am Maria McDonald



1 MECHANICAL PIPING PLAN  
M 201 1/8" = 1' - 0"

KEYNOTES	
1	PROVIDE NEW DOUBLE WALL FLUE FOR THE NEW GAS FIRED EQUIPMENT. UP THROUGH ROOF. PROVIDE MANUFACTURER APPROVED ROOF TERMINATION (I.E. ROOF FLASHING, COLLAR, VENT CAP, ...). FOLLOW MANUFACTURER RECOMMENDATION FOR FLUE SIZING AND INSTALLATION. SEAL PENETRATION WEATHER TIGHT. TERMINATE 36" ABOVE ROOF DECK.
2	NEW 1-1/2" GAS PIPING BY PLUMBING CONTRACTOR. COORDINATE CONNECTION TO NEW GAS HEATER WITH PLUMBING CONTRACTOR.
3	NEW GAS PIPING BY PUMBING CONTRACTOR. EXACT ROUTING TO BE COORDINATED WITH EXISTING FIELD CONDITIONS. PROVIDE ALL REQUIRED OFFSETS TO GET AROUND EXISTING STRUCTURAL ELEMENTS, LIGHTS, AND OBSTRUCTIONS.

NIV5

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CONSULTANT

PROJECT NAME  
CITY OF WORCESTER  
HEATING  
SYSTEM  
UPGRADE  
29 ALBANY ST.  
  
Worcester, MA

KEY PLAN

REVISION/ISSUANCE		
#	DESCRIPTION	DATE

PROJECT NO.: 25-000294  
DESIGNED BY: DSG  
CHECKED BY: CH  
DATE: 10.15.2025  
SCALE: 1/8" = 1' - 0"

SHEET NAME  
MECHANICAL PIPING  
PLAN

SHEET NUMBER  
M201

1/8" = 1' - 0"  
0 8' 16'



DEMOLITION GENERAL NOTES

1. REFER TO THE MECHANICAL DEMOLITION PLAN ON THIS SHEET FOR THE EXTENT OF THE DEMOLITION SCOPE OF WORK AND AREA. THE DEMOLITION PLANS INDICATE THE GENERAL INTENT AND ARE NOT INTENDED TO SHOW ALL ITEMS TO BE REMOVED OR RETAINED.
2. THE LOCATIONS OF EXISTING EQUIPMENT INCLUDING PIPING, DUCTWORK, EQUIPMENT, CONDUITS, ETC ARE SHOWN IN AN APPROXIMATE WAY ONLY. VISIT THE SITE PRIOR TO SUBMISSION OF THE BIDS AND COMMENCEMENT OF WORK TO BECOME FAMILIAR WITH THE ACTUAL CONDITIONS AND EXTENT OF THE WORK.
3. TRACE AND LABEL ALL EXISTING SYSTEMS WITHIN THE DEMOLITION AREA AND BEYOND PRIOR TO DISCONNECTION AND REMOVAL TO ENSURE THAT NO AREA OUTSIDE THE DEMOLITION AREA IS AFFECTED. REVIEW IN DETAIL WITH THE GENERAL CONTRACTOR AND OWNER WHAT IS TO BE REMOVED AND REMAIN PRIOR TO WORK COMMENCING THE DEMOLITION. THERE SHALL BE NO INTERRUPTION OF SERVICES OUTSIDE THE DEMOLITION AREA WITHOUT APPROVAL FROM THE OWNER'S REPRESENTATIVE.
4. COORDINATE EQUIPMENT REMOVAL WITH ALL PARTIES TO PROVIDE DISCONNECTION. REMOVE EQUIPMENT BY UNFASTENING AT THE SUPPORTS OR ATTACHMENTS. ALSO REMOVE THE ATTACHMENTS FROM THE BUILDING, LEAVING NO COMPONENT OF THE ORIGINAL INSTALLATION.
5. PROMPTLY REPAIR ANY DAMAGE CAUSED DURING/BY THE EXECUTION OF WORK. DAMAGE INCLUDES BUT IS NOT LIMITED TO DESTRUCTION OF ITEMS INTENDED TO REMAIN OR TO BE SALVAGED.
6. NOTIFY THE OWNER'S REPRESENTATIVE IMMEDIATELY OF ANY UNANTICIPATED HIDDEN CONDITIONS ENCOUNTERED DURING THE DEMOLITION.
7. ALL ITEMS REMOVED SHALL BE OFFERED TO THE OWNER FOR SALVAGE. IF THE OWNER DOES NOT TAKE POSSESSION, DISPOSE OF THE ITEMS IN A SAFE AND LEGAL MANNER. ALL ITEMS CLASSIFIED AS HAZARDOUS SHALL BE DISPOSED AS HAZARDOUS WASTES AND A UNIFORM HAZARDOUS WASTE MANIFEST SHALL BE PROVIDED TO THE OWNER.
8. ENSURE THE SAFE PASSAGE OF PERSONS IN AND AROUND THE BUILDING DURING DEMOLITION. PREVENT INJURY TO PERSONS AND DAMAGE TO PROPERTY. PROVIDE ADEQUATE SHORING AND BRACING TO PREVENT COLLAPSE. IMMEDIATELY REPAIR DAMAGED PROPERTY TO THE CONDITION BEFORE BEING DAMAGED. TAKE EFFECTIVE MEASURES TO PREVENT WINDBLOWN DUST.
9. DRAIN, PURGE, OR OTHERWISE REMOVE, COLLECT, AND PROPERLY DISPOSE OF CHEMICALS, LIQUIDS, GASES, EXPLOSIVES, ACIDS, FLAMMABLES, OR OTHER DANGEROUS MATERIALS BEFORE PROCEEDING WITH DEMOLITION OPERATIONS.

KEYNOTES

- |   |   |
|---|---|
| 1 | REMOVE EXISTING GAS FIRED RADIANT HEATER IN ITS ENTIRETY INCLUDING SUPPORTS, ELECTRICAL WIRING, GAS PIPING, |
| 2 | EXISTING GAS PIPING TO BE REMOVED. REFER TO FLOOR PLAN FOR LIMIT OF DEMO.                                   |

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PROJECT NAME

CITY OF WORCESTER  
HEATING  
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Worcester, MA

KEY PLAN



REVISION/ISSUANCE

#	DESCRIPTION	DATE

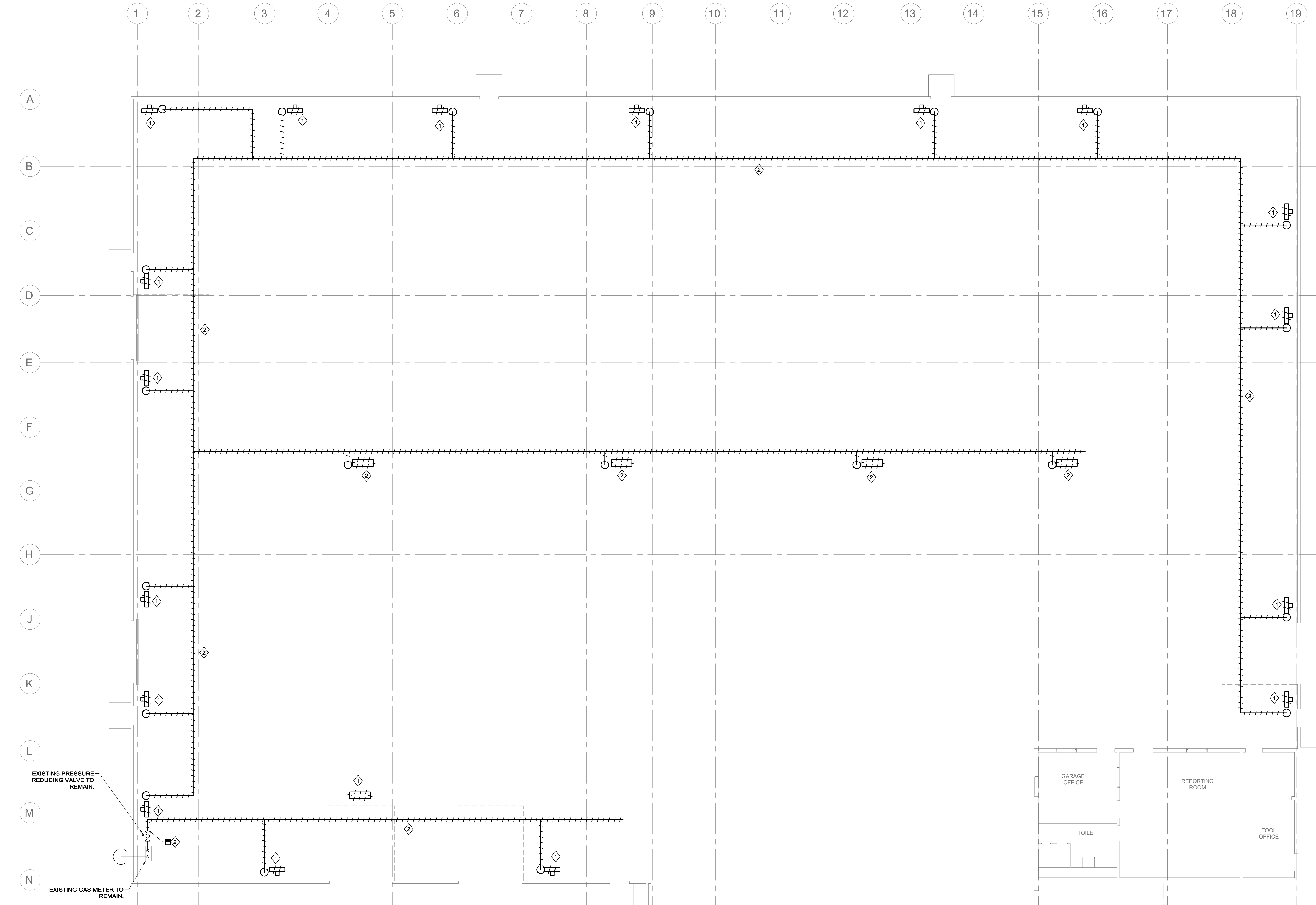
PROJECT NO.: 25-000984  
DESIGNED BY: DSG  
CHECKED BY: CH  
DATE: 10.15.2025  
SCALE: 1/8" = 1' - 0"

SHEET NAME

MECHANICAL PIPING  
DEMO PLAN

SHEET NUMBER

MD201



1 MECHANICAL PIPING DEMO PLAN

MD 201 1/8" = 1' - 0"

1/8" = 1' - 0"

